

# PEDAL FORCE SENSING APPARATUS FOR AN ELECTRIC BICYCLE

## Abstract

A pedal force sensing apparatus includes a pedal force input shaft, a force action sleeve, a torque output shaft, at least one elastomer, a micro optical pickup head module, a diversion sleeve, a linear sliding bush and a displacement sensor. The pedal force input shaft to which an input torque is applied drives the force action sleeve combined with it to simultaneously rotate. Sequentially, the force action sleeve applies forces to the elastomer to have reaction force acting on the torque output shaft. When a reverse torque from the loading of the electric bicycle is applied to the opposite end of the torque output shaft, the rotations of the torque output shaft and the force action sleeve occur, and relative angular displacement between them simultaneously exists.